

Application No. 09/680,024
Amendment filed July 9, 2004
Reply to Office Action dated April 9, 2004

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REMARKS

Claims 1-28 are pending, with claims 1, 11, 21, and 22 being in independent form. By the present amendment, claims 1, 9-11, and 19-22 are amended, and claims 25-28 are added to the application.

In the Office Action, claims 1-24 stand rejected for anticipation by U.S. Patent No. 6,608,904 to Feltström. The Applicants believe the pending claims are allowable over the cited document for the following reasons.

Anticipation requires that every feature of the claimed invention be shown in a single prior document. *In re Paulsen*, 30 F.3d 1475 (Fed. Cir. 1994); *In re Robertson*, 169 F.3d 743 (Fed. Cir. 1999). The pending claims positively recite features that are not described in the cited document.

For example, claim 1 as amended recites, among other things, "compensating for a secondary disturbance associated with the subtracting of the estimated disturbance signal component from the communication signal in a transmission scheme having periods in which no information is transmitted". Support for the amendment can be found throughout the application, and in particular on page 13, lines 1-19, of the substitute specification filed on October 13, 2000. Feltström does not disclose this feature.

As described by the Applicants, the frame structure of various transmission schemes, such as the time division multiple access (TDMA) multi-frame structure shown in FIG. 5, can include idle frames in which no radio transmission occurs. For example, the TDMA multi-frame structure shown in FIG. 5 includes an idle frame at frame 26. Because the transmitter of a remote terminal is not transmitting during an idle frame, the "bumblebee" disturbance signal referred to by the Applicants on page 2 of the application is zero during the time period corresponding to the idle frame. Consequently, the disturbance signal introduced by the switching of the TDMA circuits may not be periodic with the TDMA frame rate.

If the disturbance signal can be modeled as set forth in equation (1) on page 10 of the application, then the estimated disturbance signal will be periodic with the frame rate. Thus, subtracting the estimated disturbance signal, which is periodic with the frame rate, from the communication signal, which may not be periodic with the frame rate, to suppress the "bumblebee" disturbance signal can introduce a secondary periodic disturbance signal into the communication signal.

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To address this situation, the method of suppressing a periodic disturbance signal component of a communication signal defined by claim 1 includes compensating for a secondary disturbance associated with the subtracting of the estimated disturbance signal component from the communication signal in a transmission scheme having periods in which no information is transmitted.

Feltström does not appear to be concerned with the introduction of secondary disturbance signals that can result from the suppressing of the "bumblebee" disturbance signal, much less compensating for such a secondary disturbance signal. Accordingly, claim 1 and its dependent claims are believed to be allowable over Feltström for at least this reason.

In addition, claims 9 and 10 further define methods in which the compensating for the secondary disturbance signal can be achieved. For example, claim 9 recites, that the compensating can include "determining the position of an idle frame where no information is transmitted in a multiframe structure transmission scheme" and "suspending the subtracting of the estimated disturbance signal component from the communication signal during processing of the idle frame". As described by the Applicants at page 13, lines 25-28, of the written description, once the idle frame in a multi-frame is located, the circuitry for subtracting the estimated disturbance signal may be deactivated during the idle frame's time slot to avoid introducing a secondary disturbance signal into the communication signal.

The Office asserts that Feltström teaches that "the interference signal occurs within a GSM burst frame", at column 3, line 56, to column 4, line 13, and that claim 9 reads on this portion of Feltström. The Applicants respectively disagree. Feltström describes that a "typical GSM burst frame designed to fit within a Time Division Multiple Access (TDMA) slot may have, along with several formatting bits, 57 encrypted data bits followed by a 26 bit training sequence for the Viterbi equalizer followed by 57 encrypted data bits". Col. 4, ll. 9-13. Accordingly, the GSM burst frame includes the digitized voice signal being transmitted.

In contrast, as discussed above, an idle frame is frame in which no radio transmission occurs. Thus, while it may be true that the digitized data in a GSM burst frame can include a "bumblebee" disturbance signal, this has nothing to do with the introduction of a secondary disturbance signal that can result from the suppression of the bumblebee disturbance signal in transmission schemes that

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include idle frames. Moreover, the portion of the document cited by the Office does not disclose either determining the position of an idle frame or suspending the subtracting of the estimated disturbance signal component from the communication signal during processing of the idle frame, as the claim recites. Accordingly, claim 9 is believed to be allowable for this reason as well.

Similarly, claim 10 defines that the compensating for the secondary disturbance can include "determining the position of an idle frame where no information is transmitted in a multiframe structure transmission scheme" and "adding a disturbance signal component into the idle frame". As discussed above, because the transmitter of a remote terminal is not transmitting during an idle frame, the "bumblebee" disturbance signal will not be introduced into the idle frame.

The Applicants describe, at page 15, lines 5-9, of the written description and in FIG. 6, that a first notch filter 610 can generate a disturbance signal component having a fundamental frequency of approximately 217 Hz, and can also include higher order harmonic frequency components. The first notch filter 610 can have a sufficiently narrow bandwidth so that first notch filter 610 introduces the disturbance signal only into the idle frame. The Applicants further describe on page 15 that because the idle frame includes a "bumblebee" disturbance signal component, a second notch filter (that compensates for the "bumblebee disturbance signal" will not introduce a secondary periodic disturbance signal into the communication signal.

The Office again asserts that Feltström teaches this method of compensating at column 3, line 56, to column 4, line 13. But the Applicants respectfully assert that this portion of Feltström does not disclose either determining the position of an idle frame or adding a disturbance signal component into the idle frame, as claim 10 requires. Accordingly, this claim is believed to be allowable over the cited document as well.

With respect to independent claims 11, 21, and 22, these claims recite features that are substantially similar to those recited in claim 1. Accordingly, these claims and their respective dependent claims are believed to be allowable for at least the same reasons that claim 1 is considered allowable. Moreover, claims 19 and 20, and new claims 25 and 26 and 27 and 28 recite subject matter that is substantially similar to claims 9 and 10, respectively, and are considered allowable for at least the same reasons put forth in support of the patentability of claims 9 and 10 above.

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For the foregoing reasons, it is believed this application is in condition for allowance and an early Notice thereof is earnestly solicited. If any questions remain, the Examiner is invited to phone the undersigned at the below-listed number.

Respectfully submitted,

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By: 

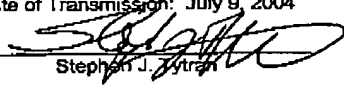
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